BS 1881-124:2015

BSI Standards Publication

# Testing concrete –

## Part 124: Methods for analysis of hardened concrete

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# Contents



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**Summary of pages**
This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 36, an inside back cover and a back cover.

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# Foreword

## Publishing information

This part of BS 1881 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 August 2015. It was prepared by Subcommittee B/517/1, *Concrete production and testing*, under the authority of Technical Committee B/517, *Concrete and related products.* A list of organizations represented on this committee can be obtained on request to its secretary.

## Supersession

This British Standard supersedes BS 1881-124:1988, which is withdrawn.

## Information about this document

In 2012, in cooperation with eleven UKAS-accredited testing laboratories, the Concrete Society Working Group undertook two round-robin trials using the BS 1881-124:1988 [1)] analysis methods for cement content, chloride content, sulfate content, alkali content and original water content based on the laboratories' accredited methods. The tested samples included hardened concrete made with CEM I only and concrete containing CEM I with GGBS or fly ash. The repeatability and reproducibility were significantly poorer than in a 1983 exercise and the Concrete Society Working Group recommended that the methods could continue to be used, but in full knowledge of the potential levels of inaccuracy. The findings of the 2012 round-robin trials are summarized in Concrete Society Technical Report 32 (second edition), *Analysis of hardened concrete: A guide to tests, procedures and interpretation of results* [*1*].

### Relationship with other publications

The BS 1881 series contains test methods for concrete currently used in the United Kingdom which are not covered by BS EN 12350, BS EN 12390 and BS EN 12504. Reference is made to the relevant part of BS EN 12350, BS EN 12390 and BS EN 12504 where appropriate. These test methods may be used in conjunction with BS EN 206.

- BS 1881, *Testing concrete*, is published in the following parts:
- BS 1881-113, *Method for making and curing no-fines test cubes*;
- BS 1881-119, *Method for determination of compressive strength using portions of beams broken in flexure (equivalent cube method)*;
- BS 1881-122, *Method for determination of water absorption*;
- BS 1881-124, *Methods for analysis of hardened concrete*;
- BS 1881-125, *Methods for mixing and sampling fresh concrete in the laboratory*;
- BS 1881-129, *Method for the determination of density of partially compacted semi-dry fresh concrete;*
- BS 1881-130*, Method for temperature-matched curing of concrete specimens;*
- BS 1881-131, *Methods for testing cement in a reference concrete*;
- BS 1881-204, *Recommendations on the use of electromagnetic covermeters*;
- BS 1881-206, *Recommendations for determination of strain in concrete*;
- BS 1881-207, *Recommendations for the assessment of concrete strength by near-to-surface tests*;

1) This has been superseded by this British Standard.

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- BS 1881-208, *Recommendations for the determination of the initial surface absorption of concrete*;
- BS 1881-209, *Recommendations for the measurement of dynamic modulus of elasticity*;
- BS 1881-210, *Determination of the potential carbonation resistance of concrete – Accelerated carbonation method*

### Hazard warnings

**WARNING.** Where skin is in contact with fresh concrete, skin irritations are likely to occur owing to the alkaline nature of cement. The abrasive effects of sand and aggregate in the concrete can aggravate the condition. Potential effects range from dry skin and irritant contact dermatitis, to severe burns in cases of prolonged exposure. Take precautions to avoid dry cement entering the eyes, mouth and nose when mixing mortar or concrete by wearing suitable protective clothing. Take care to prevent fresh concrete from entering boots and use working methods that do not require personnel to kneel in fresh concrete. Unlike heat burns, cement burns might not be felt until sometime after contact with fresh concrete, so there might be no warning of damage occurring. If cement or concrete enters the eye, immediately wash it out thoroughly with clean water and seek medical treatment without delay. Wash wet concrete off the skin immediately. Barrier creams may be used to supplement protective clothing but are not an alternative means of protection.

### Use of this document

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

### Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its methods are expressed as a set of instructions, a description, or in sentences in which the principal auxiliary verb is "shall".

*Commentary, explanation and general informative material is presented in smaller italic type and does not constitute a normative element.*

### Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard cannot confer immunity from legal obligations.**

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# 1 Scope

This part of BS 1881 describes sampling procedures, treatment of samples and analytical methods to determine the cement content, aggregate content, aggregate grading, original water content, type of cement, type of aggregate, chloride content, sulfate content and alkali content of a sample of concrete.

The procedures are applicable to concretes made with CEM I cements and, in favourable circumstances, concretes containing ground granulated blastfurnace slag (GGBS).

This part of BS 1881 does not cover the analysis of concretes made with other cements and the determination of fly ash content.

# 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 410-1 (ISO 3310-1), *Test sieves – Technical requirements and testing – Part 1: Test sieves of metal wire cloth*

BS 8500 (all parts), *Concrete – Complementary British Standard to BS EN 206*

BS EN 196-2:2013, *Methods of testing cement – Part 2: Chemical analysis of cement*

BS EN 196-7, *Methods of testing cement – Part 7: Methods of taking and preparing samples of cement*

BS EN 206, *Concrete – Specification, performance, production and conformity*

BS EN 450-1, *Fly ash for concrete – Part 1: Definition, specifications and conformity criteria*

BS EN 932-1, *Tests for general properties of aggregates – Part 1: Methods for sampling*

BS EN 934-2, *Admixtures for concrete, mortar and grout – Part 2: Concrete admixtures – Definitions, requirements, conformity, marking and labelling*

BS EN 12390-7, *Testing hardened concrete – Part 7: Density of hardened concrete*

BS EN 13263-1, *Silica fume for concrete – Part 1: Definitions, requirements and conformity criteria*

BS EN 15167-1, *Ground granulated blast furnace slag for use in concrete, mortar and grout – Part 1: Definitions, specifications and conformity criteria*

BS EN ISO 1042, *Laboratory glassware – One-mark volumetric flasks*

BS ISO 3310-2, *Test sieves – Technical requirements and testing – Part 2: Test sieves of perforated metal plate*

# 3 Terms and definitions

For the purposes of this part of BS 1881, the terms and definitions given in BS 8500 (all parts) and BS EN 206 apply.

# 4 Sampling

*COMMENTARY ON CLAUSE **4***
*The tests in this part of BS 1881 are usually applied only when there is some uncertainty about the quality of the concrete (for example, the average quality of a mass of*

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